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No. 6

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CONTENTS

PLANT PATHOLOGY

VETERINARY MEDICINE

UDC 633.16:631.51

INFLUENCE OF METHODS OF SOIL TREATMENT ON INDIVIDUAL FACTORS WHICH DETERMINE BARLEY YIELD

Moscow DOKLADY VASKHNIL in Russian No 6, Jun 80 pp 14-16 manuscript received 15 Feb 79

DYUSENBEKOV, Z. D., candidate of agricultural sciences and ISMURATOV, S. B., Kazakh Order of Labor's Red Banner Agricultural Institute

[Abstract] Studies in this work were carried out (in the years 1973-1976) in the central hills of Alma-Atinskaya Oblast where mean precipitation is 378-416 mm. The spring-summer period has about 63-73% of the yearly precipitation. Air temperature in the eastern area is 2.1° C; nights can get colder in the valley hills. An outline of the experimental soil treatments (and pre-planting treatments) is presented. Soil treatments used were i) plowing to a depth of 20-22 cm; ii) flat-cutting processing to 20-22 cm; and iii) unprocessed stubble. Variants of processing involved combination of one of these three with different planting procedures. The harvest yields for the combinations of soil processing and pre-sowing, for each of the years 1973 to 1976 are tabulated. It is concluded that ii) was most effective from 1974 to 1976. Differentiated use of processing methods, with due attention to various weather developments can certainly increase effectiveness of the usual methods for obtaining good crop yields, with respect to barley. References: 4 Russian.
[586-8586]

UDC 633.15:001.18

PROGRAMMING OF CORN GRAIN HARVEST YIELDS ON IRRIGATED LANDS OF THE UKRAINIAN STEPPE

Moscow DOKLADY VASKHNIL in Russian No 6, Jun 80 pp 10-12 manuscript received 30 Oct 79

TSIKOV, V. S., LIVENSKIY, A. I. and KUNITSA, V. M., candidates of agricultural sciences. All-Union Order of Labor's Red Banner Scientific Research Institute of Corn

[Abstract] Data on crop yields have indicated that broad introduction of programming in cultivation of corn on irrigated lands in parched regions is an important standby for further improving crop productivity and harvest of this grain. Studies were begun on that programming in 1974. The corn under trial was Dneprovskiy P 50 and Krasnodarskiy P 303, average-late maturing hybrids. Requirements for fertilizer were calculated by the balance method (Kayumov, 1977; Shatilov, 1974; Chernyavskaya, 1976);

soil moisture maintenance and plant density were controlled. The crop yeild was calculated for 100 centners per hectare; in 1974-1978 101.8 cent/ha was the average actual yield. Mineral fertilizer dosages of the soil were calculated; these were found to vary, depending on yield. Agrotechnical procedures used were consistent for each year. Programming of yields relied on the use of a biological model of productivity and farming for a 100 cent/ha harvest on the Ukrainian steppe--experience provided by the model indicated the monitoring needed in the field. Field work was done on the sovkhozes "Peremoga" and "Sovkhoz imeni XXV Congress of the CPSU". Man hours expended per ruble yield were calculated and found to be more favorable than in pre-1974 years. References: 5 Russian. [586-8586]

UDC 001.1+63+(571)

ROLE OF AGRICULTURE IN THE DEVELOPMENT OF THE PRODUCTIVE FORCES OF SIBERIA AND THE FAR EAST

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 3(282), Mar 80 pp 88-92

GONCHAROV, P. L., academician, All-Union Academy of Agricultural Sciences imeni V. I. Lenin

[Abstract] The Siberian department of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin, which was founded ten years ago, now includes 42 scientific-research institutions and 60 experimental-production farms. An agricultural-science center is being constructed near Novosibirsk. New sorts of spring and winter wheat and increased harvest yields via early-ripening hybrids and improved methods for sowing, irrigation and fertilization are among their accomplishments. Other studies included silage cultivation, technology for utilizing fertilizer raw-material resources, erosion prevention, selection of wheat, barley, alfalfa, Brome grass, soy, sea buckthorn, currant, spring vetch, oats and potato crops. However, better winter wheat, grain-legumes, groats and pasture grass are needed. Immunity, genetics, cell culture and monosome analysis have been investigated. Technology for large-scale milk, cattle, swine and poultry farming, new types of large-horned cattle, swine and sheep and new disease control measures have been developed. Tractor use has greatly increased. Layered working of solonetz soil has been widely adopted and agricultural development of the Baykal-Amur Railroad zone is progressing. The Academy is currently developing an "Agrarian Plan for Siberia", which will be a strategy for investigating and improving Siberian agriculture. [578-12126]

UDC 001.1+636.6+(47+57)

DEVELOPMENT OF THE SCIENCE OF LAND HYDRORECLAMATION IN THE USSR

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 3(282), Mar 80 pp 75-80

SHUMAKOV, B. B., academician, All-Union Academy of Agricultural Sciences imeni V. I. Lenin

[Abstract] A. N. Kostyakov laid the foundation of Soviet land reclamation science. His colleagues have studied hydrotechnical systems, water economy, canals, reclamation theory, water-sun regime regulation, soil desalinization, erosion prevention, floating irrigation apparatus, effective use of reclaimed land in areas of excess humidity, methods for using underground water and vertical drainage. Irrigation has been widely applied. Since 1974, irrigation has been organized on a larger scale with an increased technological level. In the future it is necessary to develop highly automated and mechanized irrigation systems, including subsoil, dropping and aerosol. Parallel regulation of wind, sun, nutrients, heat, soil chemistry, microclimate and phytoclimate is needed. New mechanized drainage methods are required. Laser light, ultrasound, compressed air, explosives, high-pressure water jets, electromagnetic pulses and electrohydraulic and thermal effects must be utilized. A system for planning and controlling water economy must be developed. Automation, telemechanization, unification and standardization of equipment are necessary. These problems can only be solved by the cooperation of various scientific disciplines. [587-12126]

UDC 001.1+631.17+621.311

CONTRIBUTION OF SCIENCE IN THE AREA OF MECHANIZATION AND ELECTRIFICATION TO THE DEVELOPMENT OF AGRICULTURAL INDUSTRY

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 3(282), Mar 80 pp 72-75

BUZENKOV, G. M., academician, All-Union Academy of Agricultural Sciences imeni V. I. Lenin

[Abstract] The mechanization and electrification of Soviet agriculture, which began in 1930, has significantly accelerated in the last 15 years. Many scientific establishments participated in working out machine systems for plant and animal husbandry and in improving their speed. The continuous postharvest treatment of grain introduced in the 1960's has been improved to the capacity of 50-100 tons/hour. Progressive technology for harvesting, soil preparation and planting, called the Ipatovskiy method, is beginning

to be successfully used in the entire country. Fertilizer application and sugar beet and grain harvesting have been mechanized. Automated pig sties, prefabricated-unitized animal watering towers and automatic devices for infrared heating and illumination and ultraviolet irradiation of animal and poultry young have been introduced. These measures have significantly contributed to the progress of agriculture in the USSR.
[587-12126]

UDC 636/639+658.523

THEORY AND PRACTICE OF PREPARING ANIMAL PRODUCTS ON AN INDUSTRIAL SCALE

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 3(282), Mar 80, pp 62-65

KALASHNIKOV, A. P., academician, All-Union Academy of Agricultural Sciences imeni V. I. Lenin

[Abstract] The technology of preparing animal products on an industrial scale includes feed preparation and feeding, breeding, mechanization and automation, environmental controls, veterinary-sanitary measures and rational work organization. The critical factors are whether the technology used meets the requirements of highly productive animals and whether the animals developed are highly productive and suitable for industrial conditions. New technology for milk-cow maintainance, calf raising, swine production, sheep raising and poultry production has been introduced, which has greatly enhanced productivity. Feed delivery and manure removal mechanization, feed richness and product quality improvement, better herd stocking and environmental protection, and specific organization of feed production for industrial complexes are necessary. Plans for farm remodeling have been developed.
[578-12126]

UDC 631.452

SOIL FERTILITY IMPROVEMENT UNDER CONDITIONS OF INTENSIVE AGRICULTURE

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 3(282), Mar 80 pp 48-52

PANOV, N. P., corresponding member, All-Union Academy of Agricultural Sciences imeni V. I. Lenin

[Abstract] Protection of soil from erosion, salinization, swamp formation and contamination have received special attention in the USSR, as has soil organic and humus content. Humus loss makes fertilizers less effective, leads to mineral loss and increases erosion. It must be combatted using manure, compost, plowed-under plant material and mineral fertilizers. Liming, drainage and irrigation are important. Chernozem requires limited irrigation, while dry steppe soil requires overhead and underground watering. Irrigation should be planned to minimize humus loss. Chemical improvement of solonetz via desalination and dealkalinization and better methods for working with soil by mechanical means, including minimization of soil working, have been developed and applied.
[578-12126]

UDC 616.981.51-036.2(477.86)

SPREAD OF ANTHRAX UNDER THE LANDSCAPE AND GEOGRAPHICAL CONDITIONS OF IVANO-FRANKOVSK OBLAST

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 6, 1978 p 144

[Article by V. V. Vetchinin, A. A. Sukhopyatkina, O. S. Bat, and V. G. Pocapova, Ivano-Frankovsk Oblast Sanitary-Epidemiological Station and Ivano-Frankovsk Medical Institute]

[Text] The spread of anthrax was studied in relation to the landscape, soil, and geographical characteristics of Ivano-Frankovsk Oblast. The oblast can be divided into three zones according to these characteristics: plains (Dniester region), piedmont (Carparthian region), and mountain (Carpathian).

During the last 30 years sporadic cases of anthrax were reported among the population, but they were not distributed evenly throughout the oblast. They were reported most often in the plains zone and least often in the mountain zone. Thirty-four animals contracted the disease per 1000 km^2 of plains zone, but the disease appeared one-third and one-thirtieth as often in the piedmont and mountain zones, respectively. 94.8% of all the aminals with anthrax were cattle.

The correlation of cases among humans and animals in the different zones was uneven: 16, 4 and 7 animals became sick per human being in the plains, piedmont, and mountain zones, respectively.

The uneven distribution of cases of anthrax in the various zones of the oblast shows very clearly the density of the permanently infected localities. There were 27 such localities per 1000 km^2 of area in the plains zone, 9 in the piedmont zone, and 1 inhabited locality in the mountain zone, i.e., 3 and 27 times more, respectively, than in the mountain zone. The permanently infected localities were concentrated in the plains and piedmont zones. Here 96% of such localities were concentrated in 60.8% of the area of the oblast while 68% were concentrated in 26.8% of the area of the plains zone.

The uneven distribution of cases of anthrax in the permanently infected localities of the oblast was also related to the characteristics of the soil. The plains zone has typical podzolized chernozems rich in humus that are conducive to the survival and growth of the causative agent of anthrax. The piedmont zone is characterized by sod-podzolic, light gray, and sod-podzolized soils. The mountain zone is dominated by sod-burozem and brown mountain-forest soils which differ from the other soils in being more acid and having a lower humus content, factors that inhibit the growth of the causative agent. The incidence of the disease was highest in areas with typical and podzolized chernozems - in the Dniester region. It was impossible to establish any connection between the frequency of the disease among humans and the nature of their industrial or agricultural work.

Thus, anthrax was found most often in the plains zone where the soil and landscape features favor the survival and growth of the causative agent. Cattle were the most affected (94.8% of all cases among animals). The existence of permanently infected localities threatens outbreaks of the disease among humans.

Knowledge of the landscape and geographical features of the distribution of anthrax is essential for the rational development of control measures in the oblast.

[580-5214]

5214
CSO: 1840

UDC 616.981.51-036.21(470.61)

ADAPTATION OF ANTHRAX FOCI TO SOIL AND LANDSCAPE ZONES IN ROSTOV OBLAST

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 4, 1979 p 105

[Article by M. Ya. Semenov, S. B. Simonovich, R. A. Brudnyy, and Ye. S. Rogacheskaya, Rostov-on-Don Oblast Sanitary-Epidemiological Station]

[Text] Our research of the last 17 years (1958-1974) enabled us to detect a definite pattern in the location of anthrax foci and show that they are found exclusively in certain soil and landscape zones.

The soils and vegetation of Rostov Oblast are divided into three zones. The first zone comprises Azov region and Ciscaucasian chernozems and it occupies the southern part of the oblast. The second zone consists of southern and ordinary chernozems in the northern part of the oblast. The third zone consists of chestnut and light chestnut soils and it occupies the southeastern part of the oblast. These zones differ markedly from one another in humus content and thickness of the humus horizon. The soils in the first zone contain 6% humus which reaches a depth of 100 to 130 cm, but those in the second and third zones have one-half to one-fourth as much humus.

Anthrax foci exist quite often on soils with a high content of organic matter, i.e., soils in which conditions are favorable for the prolonged survival and reproduction of the causative agents of anthrax. The accounts for the uneven distribution of anthrax foci in the three zones. Of all the foci found in the oblast during the last 17 years, 53, 32, and 15% were in the first, second, and third zones, respectively.

The three zones also differed in degree of activity of the anthrax foci. The number of foci with two outbreaks constituted 22, 6, and 7% in the first, second, and third zones, respectively, while the number of foci with three outbreaks or more came to 13 and 1.5% in the first and second zones, respectively, there were none in the third zone.

Analysis of the geographic distribution of the anthrax foci revealed that the density of the cattle population (sheep, goats, large-horned cattle) in the three zones was not a direct indication of the possibility of an increased incidence of anthrax among humans and animals.

The anthrax foci have become more active in recent years in regions where irrigation systems and other installations associated with excavation of the ground are under construction.

Our typing of anthrax foci in Rostov Oblast can be used by medical and veterinary personnel as a basis for the practical planning and execution of preventive measures in anthrax foci that can help to reduce to a minimum the incidence of anthrax among animals and humans in areas where the disease is prevalent.

[580-5214]

5214
CSO: 1840

UDC 633.11+633.14:631.559

COMPARATIVE PRODUCTIVITY OF WINTER WHEAT AND WINTER RYE ON THE UKRAINIAN STEPPE

Moscow DOKLADY VASKHNIL in Russian No 6, Jun 80 pp 6-8 manuscript received 30 Jan 80

BONDARENKO, V. I., doctor of agricultural sciences, KLIMOV, A. N. and ARTYUKH, A. D., candidates of agricultural sciences

[Abstract] It is pointed out that winter rye is less demanding with respect to soil fertility and temperature conditions during the seed germination period, and is more winter resistant than winter wheat. For these reasons the basic planting acreage is concentrated in the northern part of the USSR, mostly on sandy and podzol soils where winter wheat harvests are low. The steppe zone of the country, however, also has some low-fertile and sandy soils. The present work inquires into the possibility of use of winter rye along with winter wheat under unfavorable conditions in the northern steppe of the Ukraine. The work was done in the All-Union SciRes Institute of Corn and on the Sinel'nikovskaya Selection Experimental Station over the period 1969-1978. Acclimated winter wheats Bezostaya 1, Dneprovskaya 521 and Odesskaya 51 as well as winter rye Kharkovskaya 55 were sown (after corn), fertilized with green fodder and (after wheat) over 7 periods--August to October. Conditions of soil and precipitation are given. The winter rye proved once again to be very plastic, equally effective after different predecessor crops. Yields did not very substantially over the period 1973-78. The trial winter rye was especially productive under cold conditions. References: 2 Russian. [586-8586]

UDC 001.14+634.0+631.6

CONTEMPORARY PROBLEMS IN FORESTRY AND FOREST RECLAMATION SCIENCE

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 3(282), Mar 80 pp 80-84

VINOGRADOV, V. N., academician, All-Union Academy of Agricultural Sciences imeni V. I. Lenin

[Abstract] The world scientific-technical revolution has led to a rapid decrease in the size of world forests, with serious negative consequences for water and energy reserves and the preservation of genetic stocks. In the last decade, Soviet forest science has developed significantly, particularly in fundamental investigations in ecology, the economic and social role of forests and their significance in the maintenance of

biosphere health. Recent trends include classification of plants, investigations on the cellular and organism levels, selection, forest population studies, forest biogeocenology, radioecology, dendroclimatology and geochemistry. Both the value of wood and the nature-preserving role of forests are increasing. These two conflicting needs must be balanced. Wind-breaking forest borders are important here, as are intrazonal steppe forests and the study of the forest as one of the mechanisms for pest regulation, erosion prevention and pasture protection.
[578-12126]

UDC 631.1

ACTUAL PROBLEMS OF THE DEVELOPMENT OF AGROECONOMIC SCIENCE UNDER MODERN CONDITIONS

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 3(282), Mar 80 pp 84-88

NIKONOV, A. A., academician, All-Union Academy of Agricultural Sciences imeni V. I. Lenin

[Abstract] The intensification of agriculture and the increase in its economic complexity necessitate deeper study of the principles of agricultural development under new conditions, better resource utilization and the advantages of large-scale production. Development of stable growth in the means of production, prevention of disproportion and determination of the optimal proportions of agrocultural-industrial complexes are important current tasks of agroeconomics. The theory and methodology of planning must include consideration not only of intermediate, parochial institutional gains, but also of the final result. The formulation of effective economic control mechanisms, democratization of control, problems in production specialization and industrialization and model development, particularly on a regional level, all require further study. The relationship of Soviet agriculture to that of the entire world must be emphasized. Successful solution of current problems requires the cooperation of workers and economists.
[578-12126]

EPIDEMIOLOGICAL ANALYSIS OF ANTHRAX IN SVERDLOVSK

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 5, May 1980 pp 111-113

[Article by I. S. Bezdenezhnykh and V. N. Nikiforov, of the Main Sanitary and Epidemiological Administration of the RSFSR Ministry of Health and the Central Order of Lenin Institute for the Advanced Training of Physicians, Moscow]

[Text] Anthrax [Editor: commonly known in the Russian literature as Siberian ulcer] is an ancient infection. In the many millions of years of its existence it has penetrated all the continents at different times and by different paths [7]. In Europe, anthrax is registered mainly in countries with a developed animal husbandry. In the USSR, infections of animals and people are encountered in various geographic and climatic zones [4,5,6,7,11].

Among diseases of animals, anthrax is distinguished by breadth of distribution, which is connected with soil foci that have existed for more than 40-50 years in a number of cases. It is precisely soil foci which determine the danger of a locality with respect to anthrax [2]. As a rule the foci are encountered on lands with chernozem, chestnut, alluvial and other types of soil, rich in humus, with an alkaline reaction, a certain moisture content, temperature and the necessary content of trace elements, and a suitable soil cover [8]. However, methods of soil sanitation have not yet been well developed [9,11]. In Sverdlovskaya Oblast, infections of people and animals testify to the presence of soil foci of anthrax.

In Sverdlovskaya Oblast, soil foci of anthrax embrace an extensive territory in a mosaic pattern. From 1936 to 1968, 159 flareups were recorded there among animals in 34 rayons and cities; 371 points that are always dangerous have been discovered, at 48 points of which the outbreaks have recurred from 2 to 6 times. Therefore the territory of the oblast is justifiably considered endemic with respect to anthrax [10].

The role of the soil in the infection of animals through their food is great, especially where there are counted and unknown animal burial grounds and rubbish heaps. Spores can get into the food of domesticated animals not only with soil particles but also during the use--as supplements--of bone, blood and meat meal [5]. It is possible for animals to be infected by blood-sucking arthropoda that act as mechanical carriers of the pathogenic agent from diseased animals in the stage of bacteremia.

Skin, intestinal, pulmonary and septic forms have been described in man until recent times. It is considered that any clinical form of the disease can be complicated by anthracic sepsis, and separation of primary intestinal and pulmonary forms is acknowledged to be provisional. Therefore it has been proposed that, along with the skin, only the septic (visceral) form of anthrax be distinguished.

In the past, multiple cases of the visceral form of anthrax were often observed because of on-the-farm slaughter of cattle and the unprofessional processing of meat at small enterprises [11]. However, a large portion of the flareups and especially of family infections has remained undescribed, and information about them has been preserved only in the files.

One of the reports contains information about five flareups in the course of 25 years, in which from 5 to 40 persons were ill [6]. The reports include a description of a flareup in Yaroslavl'. Twenty-seven persons were ill there from 6 to 17 June 1923. The patients were solitary workers who had eaten various foodstuffs, including boiled sausage. The illnesses started with symptoms characteristic of influenza or gastroenteritis [3]. In another report there is information about three flareups that affected from 3 to 11 persons [4]. Descriptions of illnesses in different families have also been published [1,11].

There is no doubt of the possibility of infection during the slaughter and dressing of the carcasses of animals infected with anthrax or from use of infected meat and meat products for food. It also is known that spores in meat die only after intensive heat treatment. Nevertheless, meat partially rendered harmless rarely causes several illnesses in a single family. One person usually proves to be ill.

Sporadic infection with anthrax of people in one of the rayons of Sverdlovsk was preceded by a flareup of anthrax among agricultural animals in individual farms of adjacent rural areas. The animals probably were infected through their food.

The slaughter of cattle at individual farms increased noticeably in March-April and the meat was sold privately on the outskirts of the city. The possibility of the sale, by the private sector, of meat of animals that had to be slaughtered was not eliminated. At the same time, single illnesses with anthrax were registered among the people, and there were skin and intestinal forms of the infection. Laboratory tests of the infected people and animals confirmed that the illnesses were anthracic in nature.

The distribution of patients by dates of illness, with consideration of the briefness of the incubation period, permitted excluding infection through meat arriving through the centralized market to feed the population. In that case flareups of the disease would be expected.

The pathogenic agent of anthrax was isolated from meat taken for investigation in two families where there were patients. In both cases the meat had been bought from private persons in unorganized markets. The strains of the pathogenic agent of anthrax which were isolated from the meat did not differ from those isolated from the diseased people. This demonstrated that infected meat caused the infection of those patients.

In another case the infection with anthrax was connected with an on-the-farm slaughter of a diseased sheep. The owner of the diseased animal fell ill with the skin form.

Studies of air samples from the dwellings of patients and from hospital wards and wipings from the walls, utensils and furniture with which the anthrax patients came into contact gave negative results in all cases. Therefore the previous opinion that one suffering from anthrax is not dangerous to those around him was once more successfully confirmed.

Foci were disinfected by the moist method. Emergency prophylaxis with antibiotics was carried out by members of the patients' families. The preparations were prescribed in accordance with instructions. In areas where there were infections of people and animals the population was immunized. In the city, the vaccine was administered by needleless injection and, in the countryside, cutaneously.

The veterinary service carried out disinfection in foci of disease of animals and mass immunization of cattle. The meat of individual slaughtered animals was withdrawn from consumption

Conclusions

1. Sporadic cases of anthrax disease among people were preceded by a flareup of that infection among agricultural animals.

2. The infection occurred through meat purchased from private persons or when carcasses of diseased animals were being dressed.

3. Strains of the pathogenic agent of anthrax isolated from the meat did not differ from strains isolated from the diseased people.

4. Patients with anthrax do not discharge the pathogenic agent into the environment and are harmless to those around them.

BIBLIOGRAPHY

1. Aver'yanov, K. K. ZHURNAL MIKROBIOLOGIYA, 1940, No 8.

2. Andromnikov, V. A. In book: Dostizheniya i perspektivy bor'by s sibirskoy yazvoy v SSSR. Tezisy dokladov (Achievements and Prospects in the Control of Anthrax in the USSR. Summaries of Reports). Moscow, 1978, p 143.

3. Barykin, V., Vygodchikov, G. and Sazhina, Ye. GIGIYENA I EPIDEMIOLOGIYA, 1926, No 1, p 23.

4. Bashenin, V. A. Kurs chastnoy epidemiologii (Course of Special Epidemiology). Moscow, 1955, p 345.

5. Burgasov, P. N. and Bezdenezhnykh, N. S. Nauchnyye osnovy organizatsii profilaktiki infektsionnykh bolezney (Scientific Principles of Organization of Prophylaxis of Infectious Diseases). Moscow, 1977, No 1, p 312.

6. Gromashevskiy, L. V. and Vayndrakh, G. M. Chastnaya epidemiologiya (Special Epidemiology). Moscow, 1947, p 634.

7. Karpenko, I. G. and Kuz'min, G. G. In the book: Dostizheniya i perspektivy bor'by s sibirskoy yazvoy v SSSR. Tezisy dokladov, 1978, No 1, p 12.

8. Lebedev, V. I. In the book: S'yezd epidemiologov, mikrobiologov, gigiyenistov i sanitarnykh vrachey Ivanovskoy oblasti. 1-y. Materialy (Congress of Epidemiologists, Microbiologists, Hygienists and Sanitary Inspectors of Ivanovo Oblast. 1. Materials), 1971, pp 81-93.

9. Polyakov, A. A., Pilipenko, V. N. and Volkovskiy, G. A. In the book: Dostizheniya i perspektivy bor'by s sibirskoy yazvoy v SSSR. Tezisy dokladov. Moscow, 1978, p 159.

10. Popugaylo, V. M., Sukhanova, R. P. and Kukhto, M. N. In the book: Aktual'nyye voprosy profilaktiki sibirskoy yazvy v SSSR. Tezisy dokladov (Urgent Questions in the Prophylaxis of Siberian Ulcer in the USSR. Summaries of Reports), 1974, p 50.

11. Tokarevich, K. N. Zooantroponozy professional'nogo kharakter (Occupational Zooanthorponoses), 1969, p 90.

[586-2174]

2174
CSO: 1840

UDC 616.981.51-036.21-084.4(478.9

PREVENTION OF ANTHRAX IN MOLDAVIA

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 5, 1973 pp 121-125

[Article by E. N. Shlyakhov and V. I. Prisakar', Kiev Medical Institute]

[Text] Until the establishment of the Soviet regime, Moldavia had one of the highest incidences of anthrax in the country. The insemination of Moldavian soil with the spores of the causative agent was particularly widespread during the years of German-fascist occupation.

It is clear from the veterinary reports and reports of the sanitary-epidemiological stations in the early postwar years that anthrax occurred in almost every part of Moldavia, especially the northern rayons of the Dniester region and the Soroki, Belitskiy, and Orgeyevskiy districts. With the restoration of Soviet power in the republic, extensive combined veterinary and medical measures were instituted to lower the anthrax rate. A great deal of work was done to clear up the area where military actions had taken place, the major roads, pastures, and cattle passes. The principal actions to restore the cattle burial grounds were planned in 1940-1941.

Large-scale campaigns to immunize cattle with STI vaccine were begun and by 1945, 186,200 animals were immunized. Their number increased more than fivefold in 1946 and 1,200,000 head of cattle were vaccinated in 1949-1950.

The first period of the effort to control anthrax embraced the years 1946 to 1950. A variety of health measures were undertaken at this time: cleaning up old animal burial grounds and creating new ones, banning the secret slaughter of cattle, disinfecting the carcasses of large animals, applying the Ascoli test to animal skins, hides, and wool, making veterinary inspection of the meat and dairy industry mandatory, carrying out disinfection in foci of the disease, improving working conditions and personal hygiene of workers in the tanning and fur industry, etc. Thanks to these measures, the incidence of anthrax among animals and human beings in 1950 was 60 and 74% lower, respectively, than in 1950.

Despite the substantial decrease achieved in the anthrax rate in the Moldavian SSR by 1950, it was still fairly high compared to that in the other republics. Incomplete registration and, consequently, vaccination of the cattle, vaccination of animals only in places where anthrax was prevalent, slowness in vaccinating young and imported animals, secret slaughter and frequent concealment of the death of privately owned cattle were the main reasons why the anthrax rate remained high. As a result, the ministries of agriculture and of health issued several orders and decrees in 1951 aimed at controlling zooanthroponoses, anthrax in particular. These actions inaugurated the second period of the effort to control anthrax (1951-1958).

Systematic vaccination of cattle was an important development. About 2 million head were vaccinated in 1951 alone. The systematic vaccination of human beings who handle animals or who work in industries that process animal raw material was introduced the same year. A total of 30,753 persons were vaccinated in one year. Regular inspection of carcasses and use of the Ascoli test was initiated. About 90,000 carcasses were inspected in 1951 alone and 16 of them were found to be infected with anthrax. The Ascoli test was applied to more than 155,000 samples of raw hide and 357 of them proved to be positive. All the infected carcasses and hides were destroyed. A variety of steps were taken to protect the soil against insemination with the causative agents of anthrax, e.g., certification and registration of all cattle burial grounds, cleaning them up and fencing them in, introduction of biothermal pits for the burial of animals that died of anthrax, etc.

Medical measures taken in the Moldavian SSR included compulsory isolation and hospitalization of persons who contracted the disease, prophylactic administration of antianthrax serum to those who came into contact with the sick, epidemiological survey and decontamination of foci of the disease, introduction of hygienic measures for industrial workers (e.g., wearing protective clothing and maintenance of personal hygiene). More people were brought into sanitary engineering work and health education was vigorously promoted. Thanks to the introduction and implementation of the above-mentioned measures, the incidence in 1958 of anthrax among animals and human beings was 80 and 70% lower, respectively, than in 1950. The mean annual sick rate among human beings was 4.2 times lower in the second period than in the first.

The third period began in 1959. The actions taken that year to control the disease brought it down to the point where there were only sporadic cases. The incidence among animals and human beings in 1970 was 60 and 92% lower, respectively, than in 1958.

This sharp drop was due to two factors. First, the implementation of epidemic control measures improved greatly. In 1959 individuals whose work placed them at high risk of contracting anthrax were painstakingly screened and inoculated with STI vaccine. The quality of epidemiological

examination of every single case improved substantially. Anthrax foci were discovered not only in places where the disease was detected among humans and animals but also during epidemiological surveys of farms and inspection of infected skins in procurement centers (for the certification of hides). The information system between the veterinary and medical services improved. Terminal disinfection was carried out in all the anthrax foci detected (in places where animals died, in meat warehouses, in kitchens, in places where hides were kept, diseased animals), and in the homes of sick people. Individuals who had been in contact with the latter were given antianthrax serum or antianthrax globulin.

Since there were still cases of late hospitalization, steps were taken to increase the familiarity of medical personnel with the epidemiology, diagnosis, and treatment of anthrax. The diagnosis was greatly improved by the extensive use of the anthrax allergen anthraxin.

The measures used to raise the health and cultural levels of the population also played an important part.

Second, improved execution of control measures likewise contributed to the decline in incidence of anthrax. Such actions as analysis and mandatory registration of foci, disinfection of contaminated structures, improvement of old animal burial grounds and extensive construction of Bekar' pits (139 in 1961) were taken to sanitize permanently infected localities and certain areas of pastures and grazing grounds.

Total vaccination of cattle in the private sector was initiated in 1959. In permanently infected regions, cattle in the public sector were vaccinated twice as a prophylactic measure. This was done in the private sector in 1967. All animals dying of anthrax as well as existing meat products and hides were destroyed in strict accordance with veterinary regulations.

Also effective were the efforts to do away with secret and compulsory slaughter of cattle and to monitor plants processing animal raw materials and procurement centers.

The organization of veterinary and epidemic control measures and the regular inspection of meat, wool, and hides resulted in the eradication of anthrax as an occupational disease among workers in the raw material processing industry, butchers, and cattle slaughterers. The sick rate among the urban population declined sharply at this time because of improvement in the procedures for slaughtering cattle and dressing carcasses.

Morbidity continued to decline throughout the republic in the third period, but it was not uniform and was followed by rises as in 1963. The epizootological situation was extremely unfavorable that year. A total of 197 animals became sick, 141 of them died and the rest had to be killed because of adverse climatic conditions (dry year, sparse vegetation) that were conducive to the infection of cattle.

After the above-described prophylactic measures were taken, the mean annual sick rate per 100,000 population was 6.5 times lower in the third period than in the second and 25 times lower than in the first. Only sporadic cases are now reported among the population, but not among workers in the animal raw material industry. They usually occur in rural areas and are due to the violation of veterinary laws.

However, despite the decline of the sick rate to sporadic cases, the total control of anthrax and its eradication as a nosological entity is still a difficult problem that will have to be earnestly studied for many years to come [3, 4]. The disease can be eradicated only by exterminating the causative agent as a biological species in a given area. Since it survives in the soil in the form of an exceptionally stable spore, eradication of the infection is absolutely dependent on effective decontamination of soil foci [4].

In view of the scientific and technical difficulties still in the way of decontaminating soil infected with the spores of the causative agent of anthrax, we will have to consider the question of protecting animals and human beings against the disease, which might be arbitrarily defined as the "protective" stage of eradication [5-7]. It will be necessary to move in two directions [6, 7]. First, the competent agencies will have to acquire precise information about the soil foci within the active administrative unit, ban the pasturing of cattle in those places, and protect the soil against further infection by burning dead animals on the spot. The second approach will require complete, high-quality vaccination of all farm animals, i.e., action against the source of the causative agent of the infection. Failure to immunize all the animals properly would lead to outbreaks of the disease even where it did not occur for a decade.

As for increasing the resistance of the population, only those groups should be vaccinated whose work places them at high risk of contracting the disease. Because prophylactic vaccination against anthrax is practised in the Soviet Union, it will always be necessary to improve the vaccines, vaccination schedules, and methods of evaluating their efficacy.

Anthrax cannot be eradicated only by vaccinating cattle because the existence of stable soil foci constantly threatens outbreaks both among animals and among humans. This is confirmed by the fact that persons who have had no contact either with animals or with animal raw material may become infected. To control anthrax, it is essential at this time to disinfect existing soil foci and prevent new ones from developing. This will require strict registration, mapping and veterinary and medical inspection of such foci. To provide proper handling of carcasses, the creation of new animal burial grounds should be prohibited and kolkhozes urged to construct only biothermal pits.

It is necessary to ban the criminally-punishable offense of secret slaughter of cattle because it results in the causative agent of anthrax spreading to new areas.

Efforts must be made to sanitize anthrax soil foci because of the great resistance of the spores. Several methods have been suggested for this purpose. One of them involves using natural permanent ecosystems by sowing certain plant species [1] whose biological factors are destructive to the causative agent of anthrax. The use of antibiotics and actinomycetes as well as the KO-2,4 fire cultivator [8] have been suggested as means of decontaminating anthrax foci.

A variety of disinfectants such as No 77, 74-B, Piram, Niram, and Hypochlor were recently proposed for the treatment of environmental structures. They are all very powerful oxidizing agents with strong bactericidal action. They should be promptly studied and introduced into practice. In addition, research to develop new methods of sanitizing the soil must be stepped up.

As all the measures described in the article are implemented and new methods of disinfection are developed, the soil will gradually lose its significance as a long-term protector of the causative agent of anthrax and the latter will disappear as a biological species.

BIBLIOGRAPHY

1. Arkhipov, V. V. In the book: Sibirskaya yazva v SSSR i perspektivy yeyo likvidatsii [Anthrax in the USSR and Outlook for its Eradication], Moscow, 1968, p 56.

2. Bosh'yan, G. M. Ibid., p 77.

3. Ginsburg, N. N. and Cherkasskiy, B. D. VESTN. AMN SSSR, No 3, 1967, p 61.

4. Cherkasskiy, B. L. Same as No 1, p 8.

5. Shlyakhov, E. N. Ibid., p 46

6. Shlyakhov, E. N. Tezisy dokl. 9-go Mezhdunarodnogo kongressa po mikrobiologii [Abstracts of Papers Read at the 9th International Congress on Microbiology], Moscow, 1966, p 714.

7. Shlyakhov, E. N. In the book: Materialy 15-go Vsesoyuzn. s'yezda epidemiologov, mikrobiologov i infektsionistov (tezisy dokl.) Proceedings of the 15th All-Union Congress of Epidemiologists, Microbiologists, and Specialists in Infectious Diseases (Abstracts of Papers Read)], Moscow, 1970 pt 1, p 104.

8. Shchelokov, N. A. In the book: Aktual'nyye voprosy profilaktiki sibirskoy yazvy v SSSR [Timely Problems in the Prevention of Anthrax in the USSR], Moscow, 1971, p 27.

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CURRENT EPIDEMIOLOGY OF ANTHRAX IN THE USSR AND WAYS OF IMPROVING PREVENTION AMONG HUMANS BY VACCINATION

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 11, 1978 pp 130-134

[Article by B. L. Cherkasskiy, A. I. Savinykh and V. Yu. Markov, Central Institute of Epidemiology, Moscow]

[Text] The progress made in lowering the incidence of anthrax among humans is fully reflected in the Soviet literature [1-4]. During the 60 years that the USSR has been in existence, the anthrax rate has decreased by a factor of 24 while the number of severe forms of the disease and the death rate also have fallen sharply. This was due to the social and economic changes that took place in the country and to the advances made in medicine and veterinary science (creation of effective methods of specific prophylaxis, diagnosis, therapy, and disinfection.

It will be noted that the amount of vaccination and revaccination against anthrax increased by a factor of 2.3 from 1967 to 1976 while the sick rate decreased by a factor of 1.7. Regression analysis revealed opposite trends in the vaccination and sick rates, but correlation analysis showed them to be inversely related ($r=-0.72\pm0.08$). It has been found, moreover, that although the trend to increasing vaccination has been constant and steady in recent years, the tendency to decreasing morbidity has been more apparent than real because, for example, the sick rate was at the 1970 level in 1975 and was at the 1969 level in 1976. Consequently, the continuous increase in immunization of humans has not led to a stable lowering of the sick rate.

In addition, computation of partial correlation factors based on dynamics of the sick rate among animals showed that the statistically detected trend to a lower incidence of the disease among humans is related not to increasing immunization but to a lower incidence among animals.

Analysis of the distribution of the disease by the number of cases in a focus showed that from 1968 to 1975 82.4% of the foci throughout the country had one case and 17.6% two or more. However, foci of the second

type accounted for 46.2% of the cases reported and in some years during this period for as much as 64.9%. Thus, the anthrax rate among humans in the USSR can be characterized as sporadic from the quantitative standpoint because it remained at a fixed level in the last decade, fluctuating only slightly in either direction. On the other hand, the above data suggest that the level was largely (about 50%) determined by the group sick rate. Qualitatively, therefore, it can be regarded as epidemic when each group of cases is due to a common source or factor in transmission of the causative agent of the infection.

Thus, immunization of humans in infected localities as presently carried out and including only certain groups of the population does not prevent widespread disease. This gives rise to the question of whether mass immunization of humans is effective and whether it is worth continuing in its existing form.

The question cannot be answered without a knowledge of the current epidemiology of anthrax because changes in the epidemic situation should be taken into account by those planning vaccination campaigns. It will be recalled that, according to the regulations now in effect, systematic immunization of anthrax is mandatory for individuals who handle publicly-owned cattle in all the permanently infected localities and for private cattle owners and their families in localities where anthrax is active, i.e., where the disease has been reported during the last 10 years. Plans also call for the vaccination of individuals (industrial and laboratory workers) at risk of contracting the disease.

From 1958 to 1966 and also from 1967 to 1975, mostly random domestic cases of anthrax among humans were reported in the USSR. They constituted 72.4 and 71%, respectively, of all cases of the disease: cattle owners and members of their families (domestic) 27.1 and 21.5%, respectively, and individuals who had no regular occupational or domestic contact with cattle (random) 45.3 and 49.5%, respectively. Occupational and agricultural diseases represented 24 and 25.3% of the cases, respectively. The share of occupational and industrial diseases (urban type) was insignificant --3.6 and 3.7%, respectively. Thus, the relative significance of occupationally-threatened groups systematically vaccinated every year remained unchanged. At the same time the number of private cattle owners and members of their families decreased somewhat while the number of individuals who had no regular occupational or domestic contact with cattle increased. It will be recalled that the latter group does not have to be vaccinated against anthrax at present, even though the risk of so-called "random" individuals contracting the disease is fairly high. This is suggested by the fact that 12.1 and 25.8% of the cases were caused by privately and publicly-owned cattle, respectively, while random cases resulting from contact with cattle not belonging to sick persons (privately-owned or not recorded as to ownership) constituted 52.1% of all cases of anthrax.

The data show that individuals who do not have regular occupational or domestic contact with cattle actively participate in the slaughter of the animals, dressing of carcasses, or other procedures, thereby making them susceptible to the disease during an epizootic. Thus, groups at risk of contracting the disease should be taken into account not because of occupational or domestic handling of cattle but because they live in a locality where anthrax is prevalent (depending on the degree of activity).

The dynamics of the distribution of cases of anthrax by age of patient can serve as a criterion of the effectiveness of immunization because, according to existing regulations, only individuals over 14 years of age are systematically vaccinated. Consequently, nonvaccinated individuals under 14 can act to some extent as controls for groups subject to vaccination. A comparison of the number of cases among individuals under 14 years of age from 1957 to 1965 and from 1966 to 1975 showed that their share in all the cases reported in the last 10 years so far from increasing, actually decreased somewhat--8.7%. Thus, there are grounds for believing that mass immunization did not affect the age structure of anthrax victims in the USSR.

It will also be noted that, when humans are vaccinated against anthrax, according to existing regulations, no account is taken of the activity and frequency of recurrence of infected localities characteristic of different regions or of the pattern of their geographic distribution.

After systematic mass vaccination against anthrax was introduced into veterinary practice in the early 1950's, the number of infected localities recurring more than once decreased to 3% of all the localities showing activity. In recent years, infected localities were for the most part active only once. The number of infected localities in the southern part of the Soviet Union that became active only once from 1951 to 1972 increased substantially compared to the prevaccination period (1929 to 1950) and the percentage of localities recurring several times decreased proportionately. In the Tatar ASSR, for example, the relative share of localities that were active only once increased from 66.9 to 82.6%, in Orlov Oblast from 52 to 89.2%, and in Altay Kray from 50.5 to 81%. In the northern part of the Soviet Union, where on-time manifestations of activity predominated, there were no significant changes in this respect.

The foregoing implies that prophylactic vaccination of animals against anthrax significantly affected the frequency of recurrence of localities in the southern regions that were characterized in the past by repeated manifestations of activity.

Study of the geographic distribution of recurrent infected localities revealed it to be uneven in that they are usually concentrated in certain administrative regions. In Dzhambul Oblast of the Kazakh SSR, for example, most of these localities are situated in three rayons: Kurday (66.7% of the permanently infected localities were active more than once, Merke (65.7%),

and Dzhuvalin (70.4%). The infected localities in the other rayons of Dzhambul Oblast were for the most part active only once.

The basis for conducting an immunization campaign in a permanently infected locality clearly should be its situation in a region where recurrent localities are concentrated. Analysis of the available data on many infected localities showed that in the last few decades the intervals between manifestations of activity were usually no longer than three years (83%). Thus, the most frequent period of recurrence (including the year of renewed activity) is four years.

As for vaccination campaigns "for epidemic indications" now conducted on a fairly large scale, their value is doubtful because individuals who have had contact with sources of the infection or transmission factors are protected by emergency antibiotic or globulin prophylaxis. If vaccinations are undertaken simultaneously with, or right after, emergency prophylaxis, an epizootic in an infected locality usually ceases even before the vaccinated individuals acquire adequate immunity (14 to 21 days after inoculation) and if all the susceptible animals are immunized, they do not consitiute a danger as a source of infection. Consequently, vaccinations "for epidemic indications" are not justified epidemiologically.

In summary, therefore, no account is taken of the current epidemiological characteristics of anthrax in the existing system of prophylactic vaccination of humans, for they either lead to unwarranted expansion of the scope of immunization or serve no really useful purpose.

Without going into the question of the effectiveness of the immunization schedule now followed, we believe the following corrections should be introduced into the system:

1. Suspend vaccinations "for epidemic indications" as epidemiologically unjustified.

2. Suspend vaccinations carried out in permanently infected localities solely because they are active (i.e., in localities where the disease was reported in the last 10 years), for only a few of them manifest activity repeatedly.

3. Carry out systematic vaccinations only in recurrent permanently infected localities, including: (a) localities active at least twice since 1950 (because satisfactory data are available for this period in most of these areas) and (b) localities active once during this time but situated in administrative regions where at least half of the infected localities were active more than once (regions where recurring permanently infected localities are concentrated).

4. Limit the vaccinations to once in four years because it was found that the interval between manifestations of activity is usually no more than three years (after this period, vaccinations should be repeated for the same time only in case of a new recurrence of activity).

5. Vaccinate all persons over 14 years of age (unless medically contraindicated) who have been residing continuously in the recurrent localities, but keep unchanged the system of prophylactic vaccination of individuals at occupational risk of contracting anthrax.

Since there is no possibility of epidemic spread of anthrax, vaccination of humans can be regarded as a means of individual rather than collective protection [5], which is justified when the level of morbidity is low. The proposed plan of selective immunization against anthrax will help to reduce the scale of immunization in the USSR as a whole and at the same time provide for the vaccination of as many persons as possible who are exposed to the threat of the disease breaking out among farm animals, thereby enhancing the effectiveness of systematic immunization of humans.

CONCLUSIONS

1. Systematic immunization of humans against anthrax is not very effective at present because it does not take into account the current epidemiological characteristics of the infection. This results in an unwarranted expansion of the scope of immunization without lowering the sick rate.

2. Groups exposed to the risk of infection should be considered for vaccination not only on the basis of occupational hazard but also because of continuous residence in recurrent permanently infected localities. Vaccinations should be carried out only once in four years.

3. Vaccinations "for epidemic indications" should be suspected as epidemiologically unjustified.

BIBLIOGRAPHY

1. Burgasov, P. N.; Cherkasskiy, B. L; et al. "Sibirskaya yazva" [Anthrax], Moscow, 1970.

2. Ginsburg, N. N. and Cherkasskiy, B. L. VESTN. AMN SSSR, No 3, 1967, p 61.

3. Korotich, A. S. and Pogrebnyak, L. I. "Sibirskaya yazva" [Anthrax], Kiev, 1976.

4. Shlyakov, E. N. et al. "Sibirskaya yazva" [Anthrax], Kishinev, 1975.

5. Sumarokov, A. A. and Salmin, L. V. ZH. MIKROBIOL., No 6, 1974 p 118.

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DETERMINATION OF DEGREE OF NONSPECIFIC RESISTANCE IN ANIMALS

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[Abstract] In pedigreed stock farming, veterinary-genetic inventory of the animals by determination of their index of nonspecfic resistance (INR) is required. This is primarily necessary in zones of such farming where acute infectious diseases are not present and where banal microflora (E. coli, staphylococci, streptococci, etc.) play an important role in the morbidity strucutre. The INR of highly-productive but low-resistant animals and poultry is very important because of the danger that the animals might lose control over their familiar microflora and thus fall prey to new forms of microorganisms. The nonspecific factors of resistance include micro- and macrophages and nonspecific humoral factors; specific factors of protection involve the activity of the lymph ti sue. The phenotypic and genotypic resistance in animals is measured by the method of Pavel (1979): four properties are determined, viz., (i) bactericidal activity of the blood serum to E. coli, (ii) bactericidal activity to Staph. aureus, (iii) lymph activity of the serum and (iv) phagocytic activity of rabbit neutrophiles. While the first two are characteristic of humoral factors (complement, properdine, beta-lysins, etc.) the third is characteristic of macrophage activity and the fourth of microphage activity. (The normal antibody titer and blood serum titer tests are not recommended because they require too many runs.) A fifth test (v) used by the authors' laboratory is the blood serum interferon titer. Test procedure is outlined. Inventory of the animals at hand is possible with respect to frequency of occurrence of phenotypes. Frequency relates to the strength of each of the test (i to v) results. References 6: 5 Russian, 1 Western.
[586-8586]

PARAFFIN BASE FOR THE MICROBIOLOGICAL INDUSTRY

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 25 May 1980 p 1

[Article by V. Ponomarev, correspondent, Kirishi, Leningrad Oblast]

[Text] "Here it is, our 'Pareks,' the leading installation of the paraffin production complex. With its appearance at the design capacity the country's national economy obtained the first large-scale raw materials base for the microbiological industry."

V. Brovko, general director of Kirishinefteorgsintez, glanced at the opposite bank of the Volkhov:

"Our neighbors especially awaited the startup of the new installation.

"They stand opposite one another, the petroleum refining and the biochemical plants. They are separated only by the river, while national economic interests unite them. The main production is "Biokhima," a famous protein-vitamin concentrate. Half a liter of that stimulant is equivalent to 3 liters of milk, and a ton to 50 quintals of select wheat. That concentrate, when added to the fodder ration of animals, helps to obtain additional meat, milk and eggs worth tens of millions of rubles."

The fodder requirement, growing from year to year, has presented biochemists a complex task. How is concentrate production to be increased on the previous raw material base? Now the problem will be solved. The production of the new complex of the Kirishskiy Oil Refinary has become valuable raw material for "Biokhima." A paraffin pipeline extends between the enterprises on the right and left banks of the Volkhov. Incidentally, it releases several railroad trains a year, relieving the Kirishi junction.

The new technological complex at the Kirishskiy Oil Refinery is the ninth introduced in the present Five-Year Plan. In a few years the enterprise has become one of the main suppliers of high-quality products. Heavy-tonnage production of plastics, synthetic fibers and rubber, film, lacquers, rubber goods and mineral fertilizers has been organized within its facilities.

The rapid maturing of the young enterprise was natural. In less than two Five-Year Plans its design capacity has increased by one third due to reconstruction. Equipment is being modernized rapidly. There is strict economy of a large and small scale in the everyday work of the collective. Such an approach permits the refinery workers to turn out additional production each year worth almost 3 million rubles.

Acceleration... That is a very popular word among the workers at Kirishi. They have more than once demonstrated by action that they know how to value time. It has taken three Five-Year Plans for the builders to raise a beautiful city and the largest power and industrial complex in the northwest. It is characteristic that all the installations of the oil refinery, including "Biokhima" and the Kirishskaya GRES, were put in operation ahead of schedule. In creating "Pareks", the builders and installers did not change traditions. The complex was put in operation and operated as planned 3 months earlier than the set data. The complex team of Hero of Socialist Labor N. Sakharov from Glavzapstroy trust No 46 out-ran the schedule by 21 days.

"There was a stressed rhythm at the construction site," said the team leader. "'Pareks' was included in the socialist obligations of Leningrad and the oblast. It could not be permitted to fail. The Leningrad party organization helped a great deal. Our specialist fr ends from the GDR also participated in construction. And so by joint efforts it has been possible to solve arising problems and strictly maintain a rigid work schedule."

The pulse of the new oil refinery complex is rhythmic and confident. Kirishi paraffin is being produced.

A meeting was held in Kirishi on 23 May. At it a message of greeting from the General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet, L. I. Brezhnev, was read to the participants in the construction and organization of the new complex for the production of liquid paraffins and oil. The participants in the meeting assured the Central Committee CPSU and Leonid Il'ich Brezhnev personally that the refinery workers will produce still more effective and high-quality work and will increase their contribution to the strengthening of the economic power of our Motherland.
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PROBLEMS, PROSPECTS OF BIOTECHNOLOGY REVIEWED

Moscow IZVESTIYA in Russian 17 May 80 p 3

[Article by A. Bayev, academician secretary of the Department of Biochemistry, Biophysics and the Chemistry of Physiologically Active Compounds of the USSR Academy of Sciences: "The Factory of the Living Cell"]

[Text] There is a traditional and obvious tie between biology and medicine and agriculture, and with the production of human food products and natural materials. This goes far back. Medicine, agriculture and the mentioned industrial sectors now have an independent existence. And no one in practical terms views them now as sectors of biology, although in actuality even now they are fed by its "juices."

Chemistry and physics have emerged on the path of modern industrial applications significantly before and with greater confidence than did biology which in this regard matured more slowly. At present its time has come.

Modern biology has established a foundation of an innovative sort, the contours and contents of which are beginning to gradually be filled out. This area has been termed biological technology or engineering. This elaborates the scientific bases for new production processes based on the use of biological agents and reactions.

The problems which presently concern mankind are beyond counting, but biology is directly involved with at least three such problems: the production of food products and above all protein, the energy balance, human health and the protection of the environment.

In biotechnology, for realizing production processes, use is made of living cells, various structures which are their component parts, and biological molecules. Mankind has long been using animal and vegetable organisms in his economic activities. The advances of modern biology have created conditions for the beneficial use not only of entire organisms, but also of their material components and processes. This is the essence of biotechnology and its difference from the traditional forms of biological processes in industry, agriculture and medicine.

There are several areas of this science, namely: cellular biotechnology (applied microbiology, the cultures of plant and animal cells), genetic, molecular biotechnology, and, finally, the modeling of complex biological processes and systems.

Undoubtedly in this list the central place belongs to applied microbiology. For a long time microorganisms have been used by man in baking, brewing beer, winemaking and in other methods of obtaining food. At present microorganisms are employed in producing such chemical products as ethyl and butyl alcohols, glycerin, acetone, acetic, lactic, and citric acids, enzymes, various pharmaceuticals, and so forth.

Thus, microbiological technology has come to held a firm place in industrial production, and there is every indication of its further intensive development. In essence, each microbe cell is a small chemical plant containing a set of biological catalysts or enzymes.

Certain microbiological processes have been developed in the most recent years. Thus, the obtaining of feed protein from certain types of yeasts raised on petroleum paraffins is carried out in our nation on a broad industrial basis. At the same time processes are being developed which envisage the use of other types of initial raw materials, namely methyl and ethyl alcohols, for these purposes.

Methane for communal and industrial enterprises can be obtained by treating municipal and agricultural wastes. For this, bacteria or microscopic algae are used. This is a solution to the energy problems and simultaneously prevents environmental pollution.

Finally, for realizing more delicate chemical processes, for example, in obtaining medicines, microbiological transformation of the initial compounds and other procedures are employed.

Also promising is the use of plant cells because the individual cell or a fragment of tissue under proper conditions are capable of producing an entire plant which does not differ from the normal. The culturing of plant cells is relatively simple, and it is employed for obtaining a vegetable biomass, for breeding berries (strawberries) and houseplants, for obtaining virus-free potatoes, vegetables and berries, and so forth.

The cultures of living cells are a more delicate object. They require the observance of strict culturing rules. The media for growing them are expensive, and normal animal cells multiply very slowly in comparison with bacteria. But at present the fundamental aspect of the question is what can be obtained in using the cultures of animal cells? It turns out, quite a bit. In cultures of human blood lymphocytes and the cells of connective tissue (fibroblasts) it is possible to obtain, for example, interferon, a protein used in treating and preventing viral infections.

A promising start has been made using cellular hybrids. Essentially, this is an old story which goes back to 1960 when success was achieved in connecting two cells belonging to different organisms into one whole. Since then, the techniques have been improved and have proven very useful, although it can not be said that it is fully controllable. The new word in this area is hybridomes, the artificial cells formed by the fusion of lymphosytes and tumor cells. These are obtained for obtaining pure antibodies or proteins which establish in the organism a state of nonsusceptibility to pathogenic microorganisms.

A new step in cellular engineering is the use of cells which have been immobilized in a gel-like medium, for example in a polyacrylamide gel. Of course, here, science is still very far from developing effective production processes, but the first experiments have shown that the idea of using living cells in such unusual systems cannot be considered fantastic.

The next area is genetic engineering, the youngest area, which is just 7-8 years old. Genetic engineering is the obtaining of artificial genetic structures by laboratory methods. Mankind has long used cross-breeding for the creation of new breeds of animals and varieties of agricultural plants. But nature has limited man's activities in this regard by those natural barriers which exclude the crossing of evolutionally remote species. It is impossible to produce hybrids of the rose and potato, or lizards and snakes. But in the laboratory it has been possible to obtain artificial genetic structures in part by chemical synthesis and in part by connecting the natural genes regardless of their origin.

The methods of genetic engineering have brought about a true revolution in studying heredity, and have opened up new applied possibilities. Obviously it will soon be possible to obtain insulin, a growth hormone, interferon and other pharmaceuticals in bacterial cells, not to mention the highly productive strains of bacteria used for the microbiological industry.

Finally, the last link in the chain of biotechnological processes is the direct use of the molecules of biopolymers and, above all, enzymes. Enzymes are now widely used in the most diverse industrial processes, for example, protease in tanning leather, pectinase in clarifying fruit juices, cellulase in processing cellulose and wood, and so forth. But enzymes are unstable, and it is difficult to separate them at the end of the process from the contents of the reactor, and this excludes their re-use.

These two shortcomings are eliminated by employing so-called immobilized enzymes. In this instance the enzyme is connected, by a chemical bond, with an insoluble base, usually a certain polymer. Thus, immediately the problem is solved of separating the enzyme from the reaction mix. The immobilized enzymes in many instances become more stable, and they lose little or no reactivity. They have already shown their practicality, and, precisely with them, incidentally, the first wave of biotechnology started at the end of the 1960's. They are used in large-scale production of dextrin, maltose, lactose, fructose, and amino acids, for obtaining fruit joices, cheese, and so forth.

The facts given show that biotechnology is already beginning to develop as an integrated system. The sphere of its use at the given time is chemical processes, and, thus, it is an alternative to chemical technology. Among its advantages one might mention first of all that the biological processes occur at a relatively low temperature and pressure. Such processes as a whole are economic, and the possible production wastes are accessible for further conversion, and they do not threaten the environment with pollution. Over the long run there is an infinite diversity of processes and organic products which comprise the future biological production. The use of cells and their components will provide an opportunity to obtain chemically complex substances, for example, proteins, cellulose and fats; enzymes provide the catalysis of individual chemical reactions.

Even now, the next state in the development of biotechnology can be seen, and it is more complicated and promising than the present one. Probably we will succeed in developing artificial systems for utilizing solar energy on the basis, for example, of the chlorophyll of the green leaf or the bacteriorhodopsin of microorganisms, these natural traps of light quanta; there will also be systems for the fixation of atmospheric nitrogen, and so forth. But this is the biotechnology of tomorrow.

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STUDY OF THE GENETIC-PHYSIOLOGICAL NATURE OF THE PROTEIN CONTENT OF WHEAT-GRAIN IN CONNECTION WITH SELECTION TASKS

Moscow DOKLADY VASKHNIL in Russian No 6, Jun 80 pp 42-44

KHOKHLOV, A. N., All-Union Order of Lenin and Order of Labor's Red Banner Selection-Genetic Institute

[Abstract] This report is predominantly a review of recent work in the title area. Earlier work (1974-76) at the author's laboratory has indicated that the protein character (of hybrid kernels) is defined by the genotype of the plants on which they are formed and is not a function of the genotype of the endosperm; further, it was found (1977) that the protein nature of the hybrid kernels is not a function of the protein nature of the pollinator. The protein content of the wheat kernel appeared not to be an endospermal train, hence selection at the level of individual grains was without purpose. In other experiments, however, (with F. Rudolf, of the East German Institute of Grain Cultures), it was found that nitrogen accumulated in the wheat kernel, under phytotron conditions, in the milky ripeness phase, to a greater extent than under field conditions and the accumulation was especially high in a low-protein-content sort--as compared to high-protein sorts under the same conditions. It could be assumed that the storing tissue has a high potential capacity to accumulate protein, a capacity usually not fully realized due to the limitations of the vegetation sphere; the further suggestion was made that endospermal tissue, in the presence of adequate nitrogen sources, could induce a higher level of protein syntheses. Thus, the reasons for different accumulations of protein in the kernel have to be sought at the level of the integral plant, in the interaction of its vegetative and generative organs, in the ratios of protein and carbohydrate synthesis. The author's lab has already proposed a formula which describes the protein content of grain as due to the interaction of three factors, viz., grain in the harvest, nitrogen in the grain, relative-yield of nitrogen, i.e., grams of nitrogen per 100 grams of biomass. The role of these factors, in practise, are discussed as they relate to selection. A major problem in selection for increased wheat content is the inverse ratio of this trait to harvest, explained by the authors as due to the effect of grain on the harvest--when it is increased by selection, the protein content of the grain is decreased. A B-16 line was isolated by the authors from bulgar hybrid material, in 1976-78, which combines a high yield of grain and good (more) protein content in the grain. At present the B-16 line has been handed over to selection departments of his Institute and of the Krasnodar SciRes Institute of Agriculture, the SciRes Institute of Agriculture of the Central Rayons of the Non-Chernozem Zones and, also, of the Institute of Wheat and Sunflower (General Toshevo, Peoples Republic of Bulgaria); it is being used to produce hybrid material. Figures 2; references 10: 5 Russian, 5 Western.
[586-8586]

UDC 631.468

METHOD OF OBSERVATION OF ANTAGONISTIC (COMPETITIVE) INTERRELATIONS OF MICROORGANISMS IN SOIL

Moscow DOKLADY VASKHNIL in Russian No 6, Jun 80 pp 3-5 manuscript received 13 Dec 79

MUROMTSEV, G. S., academician of the All-Union Academy of Agricultural Sciences imeni Lenin and Globus, G. A., All-Union Scientific Research Institute of Agricultural Microbiology

[Abstract] A method was derived to observe--directly in the soil--the antagonistic relationships between microorganisms. The procedure resorted to membrane chambers otherwise used for observation of the behavior of soil microorganisms (Andreyuk, 1974; Lagutina, 1979; Muromtsev, 1977) where the pure microbial culture (inoculum) is placed between two readily-permeable membranes (synthetic membranes, glass tissue and the like) and introduced into the soil. The high penetrability of the membranes assures good contact between the studied microorganism and the soil medium (soil air, solution and microflora). Test microorganisms chosen were fungi--antagonists and non-antagonists with respect to Verticillium dahliae Kreb wilt. The V. dahliae material was placed on one side of the membrane, spores of the saprophyte fungi on the other. Growth of the spores so-positioned is tabulated, growth of the neighbor microorganisms is also graphed. The V. dahliae was clearly inhibited by the saprophyte (on the other side of the membrane) and this is explained as a competition for nutrient elements; elaboration of an antibiotic--which inhibits V. dahliae--is, also, a possible explanation. Use of this membrane technique is felt to have potential for study of antagonistic action of fungi. Figures 1; references 5: 4 Russian, 1 Western.
[586-8586]

UDC 633.15:631.527

IN VITRO CULTURE STUDY OF CORN AND PLANTS RELATED TO IT

Moscow DOKLADY VASKHNIL in Russian No 6, Jun 80 pp 12-13 manuscript received 23 Apr 79

NESTEROV, A. Yu., SUKHANOV, V. M. and TYRNOV, V. S., candidate of biological sciences, Saratov State University

[Abstract] Some corn relatives multiply apomictically or have elements of aponixis and require development of hybrids asexually by consolidation of isolated protoplasts. In the present study, search for the most effective industors of callusogenesis used the Korichneviy marker diploid

line. Mature seeds were isolated aseptically from preliminarily moistened kernels and cultured in the dark at 25-27° with a selected nutrient medium. Best results were obtained with that medium supplemented with 2,4-D or 2,4,5-T. The medium was also supplemented with vitamins (without inositol) or with other, marked lines (e.g., for in vitro culture, or parasexual hybridization). Callus formation and growth of callus tissue has been successfully obtained. Cited especially is a culture of tissue of Coix sp., which has lasted over 1 1/2 years without loss of regenerative capacity. References 10: 5 Russian, 5 Western.
[586-8586]

UDC 633.11:581.14

MORPHOPHYSIOLOGICAL CHARACTERISTICS OF THE PHOTOPERIODIC REACTION OF SPRING WHEAT MOSKOVSKAYA 35

Moscow DOKLADY VASKHNIL in Russian No 6, Jun 80 pp 8-10 manuscript received 18 May 79

GERMAN, R. Ya., Moscow Order of Lenin, Order of Labor's Red Banner and Order of Peoples Friendship State University imeni M. V. Lomonosov

[Abstract] E. D. Nettevich (1977) prepared Moskovskaya 35, a high-yield spring wheat, by selection. German began study of its photoperiodic reaction in 1976-1977 in the Laboratory of Biology of Plant Development (Moscow State University). During vegetation, the plants were maintained (from 20 May to 10 Aug) for 8 hrs in an open area, then transferred in their pots into a luminescent chamber with additional lighting of less intensity, for 4 hr (12-hr photoperiod) and 16 hr (24-hr photoperiod). Morphophysiological assays were done based on the method of Kuperman (1977). Duration of the photoperiod and intensity of the additional illumination had a substantial effect on the spring wheat and these results are tabulated. Comparisons are protrayed between the Moskovskaya 35 and another wheat sort "Krasnozernaya". The Moskovskaya 35 spring wheat sort was adaptable to conditions of an extended day or a shortened day, and of relatively low intensity illumination. It had wider ecological plasticity, in relation to length of day, than did the Krasnozernaya wheat. References: 3 Russian.
[586-8586]

UDC 631.452

MODERN PROBLEMS IN PLANT MINERAL NUTRITION AND EXPERIENCES WITH THE INTRODUCTION OF CHEMICAL PROCESSES INTO USSR AGRICULTURE

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 3(282), Mar 80 pp 44-47

PANNIKOV, V. D., academician, All-Union Academy of Agricultural Sciences imeni V. I. Lenin

[Abstract] The question of the mineral requirements of plants is essentially solved, as indicated by the success of hydroponics. However problems remain in the area of absorption, transportation and transformation of ions in the plant. In the presence of unlimited reserves the N:P:K ratio has been found not to influence productivity. Using a phytotron, it has been possible to study the interrelationship of mineral nutrition, temperature, humidity and duration of photoperiod. The function of "ion carriers" in the plant has been clarified. The physiological-biochemical principles determining the response of a plant to a high level of mineral nutrition, however, need further study. The increased use of chemical fertilizers in the USSR has greatly increased the harvest yield. Nitrogenous fertilizers have been found to be most effective in poor, soddy-podzolic and grey forest soils with adequate water content. Phosphorus and potassium-containing fertilizers are needed for maximal effectiveness. Potassium is most useful in the presence of high doses of nitrogen and phosphorus and lime. Fertilizer systems are developed by considering the nature of the agricultural industry, distribution of irrigated and drained land, requirements of new sorts and hybrids and characteristics of new types of fertilizers.
[578-12126]

UDC 527+631.523

MAJOR PROBLEMS IN THE GENETICS AND SELECTION OF AGRICULTURAL PLANTS

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 3(282), Mar 80 pp 35-39

SOZINOV, A. A. and PUKHAL'SKIY, A. V., academicians, All-Union Academy of Agricultural Sciences imeni V. I. Lenin

[Abstract] Progress in agricultural technology has made increased demands on the selection of new agricultural plants. Dwarf grains for increased productivity have been developed, as were high-yield, smut-resistant millets. However high-productivity, cold-resistant, early-ripening corn hybrids are still needed. Intermediate-ripening, drought-resistent strains

and corn suitable for irrigation are required. Sunflower cultivation must be converted to hybrid seeds. High-protein beans, rape and sunflowers, peas which are nonshattering and resistant to drought, soy adapted to industrial conditions, disease-resistant lupine and more productive alfalfa are needed. In order to accomplish this, new selection technology is required. One must use the latest advances in genetics, induced mutation, intraspecies hybridization, gliadin composition, gene identification, chromosome engineering, life cycle acceleration and analysis of genetic reserves.
[578-12126]

UDC 632.93:001

STATUS OF AND THE PROSPECTS FOR STUDIES IN THE FIELD OF PLANT PROTECTION

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 3(282), Mar 80 pp 69-72

FADEYEV, N. Yu., academician, All-Union Academy of Agricultural Sciences imeni V. I. Lenin

[Abstract] The four all-union and six republic institutes of plant protection, as well as institutes of toxicology and pesticide hygiene, bacterial preparations and agricultural and specialized aviation have contributed to the development of plant protection in the Soviet Union. As a result, locusts, Hessian flies, gophers and cotton gummosis have been eradicated. Shield bugs, cutworm moths, meadow moths, beet weevils and Ustilagnea grain disease are under control. Prognosis of the development and distribution of harmful organisms, signaling the optimal time for protective measures and automatic, remote methods for observation have aided progress. The use of agrotechnical and biological tools such as trichogramma and pheromones has greatly increased. Recent trends include the reduction of pesticide toxicity, improved pesticide application, calculation of pest level thresholds and development of resistant plant strains. For the future, the principles of managing useful and harmful flora and fauna must be worked out as a basis for strategic and tactical decisions in plant protection.
[587-12126]

UDC 591.531.2:576.858.27

POLYPEPTIDE MAKEUP OF PLAGUE VIRUS OF CARNIVORES

Moscow DOKLADY VASKHNIL in Russian No 6, Jun 80 pp 30-31 manuscript received 13 Oct 79

NIKOLAYEVA, N. P., MEL'NIKOVA, L. A., doctor of medical sciences and PROKHOROVA, E. M., candidate of biological sciences, All-Union State Scientific-Control Institute of Veterinary Preparations

[Abstract] The distribution of plague virus of carnivores (VChP) and of its ribonucleoprotein(RNP) has been analyzed in a linear sucrose density gradient; the structural proteins of VChP have been assayed by electrophoresis in polyacrylamide. VChP strains used were KF-668 and EPM; procedures used have already been described by the authors (no reference furnished). Seven structural proteins were isolated from each of the two VChP strains, and their molecular weights (ranging from 15000 to 125000 daltons) are tabulated. The polypeptide makeup of VChP is characteristic of the group of paramyxoviruses. Density gradients are portrayed. Figures 3; references (at least 4) were omitted by printer. [587-8586]

UDC 636.21.1+636.082.1

ACHIEVEMENTS AND PROSPECTS IN THE SELECTION AND GENETICS OF FARM ANIMALS

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 3(282), Mar 80 pp 39-43

ERNST, L. K., academician, All-Union Academy of Agricultural Sciences imeni V. I. Lenin

[Abstract] Based on the methods of M. F. Ivanov, twelve new strains of large horned cattle, sixteen strains of swine, thirty strains of sheep and five poultry strains have been introduced into Soviet agriculture. More effective ways of evaluating animals have been developed and adopted. Artificial insemination, gamete storage, immunogenetics and general genetics have been used in selection. In the future animals which are more productive under the conditions of modern agricultural technology are necessary. The world's animal genetic reserves must be studied. More effective storage of genetic information must be developed. Disease resistance needs improvement. Careful planning, the participation of scientific collectives, the use of the twenty-three chief animal husbandry selection centers in the country, application of cytogenetics, cloning, egg extraction and zygote transplants, thorough study of the genetic nature of adaptation, use

of biochemical gene markers and genetic engineering, avoidance of sterile hybrids and further domestication of fur-bearing animals are all necessary.
[578-12126]

UDC 619.001.1+742

ACHIEVEMENTS AND PROBLEMS OF VETERINARY SCIENCE IN THE USSR

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 3(282), Mar 80 pp 65-69

SHISHKOV, V. P., academician, All-Union Academy of Agricultural Sciences imeni V. I. Lenin

[Abstract] In the early years of Soviet rule, veterinarians concentrated on the eradication of animal disease. The USSR has the largest school of helminthology in the world, founded by K. I. Skryabin. Recent veterinary work has involved the development of methods for the prophylaxis, treatment and diagnosis of animal disease, improved sanitation and prevention of epizootic disease and pollution. A major achievement was the preparation of cattle ring-worm vaccine. A new method for combatting cattle gadfly, highly effective hoof and mouth disease vaccine, new measures and complex vaccines against swine and poultry viral and bacterial infections, a successful campaign against swine plague, highly effective preparations against blood-sucking flies, aerosol vaccination of poultry against Newcastle's disease and methods for increasing nonspecific animal resistance are among recent advances. In the future antiepizootic measures must be improved. Eradication of brucellosis and tuberculosis, better diagnosis and prophylaxis of animal leucosis and reduction of loss from noninfectious disease are needed. Sanitary-hygienic methods for large scale farms and agricultural complexes, improved diagnosis, new means of disease prevention and more resistant animals are required. Veterinary entomology, natural foci and transmission of disease must be studied further.
[578-12126]

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